IN THE MATTER OF an Application
for a European Patent
in the name of
Transpac N.V. and Sig Pack Sapal
filed under No. 98 203 473.8, and
IN THE MATTER OF an Application
for a Patent in the U.S.A.

I, Ernest MEYERS, Patent Attorney, 261, Route d'Arlon, L-8002 STRASSEN, Grand-Duchy of Luxembourg, do solemnly and sincerely declare that I am conversant with the English and French languages, and that the following is, to the best of my knowledge and belief, a true and correct translation of the Patent Application filed under No. 98 203 473.8

by Transpac N.V. and Sig Pack Sapal

at the EPO on 15 October 1998

for "Packaging for wrapping"

and the Official Certificate attached thereto.

Dated this 18th day of December 2002

MEYERS Ernest

Europäisches Patentamt	European Patent Office	Offic européen des brevets

Bescheinigung Certificate Attestation

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The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr.	Patent application No.	Demande de brevet n°
	98203473.8	

Der Präsident des Europäischen Patentamts:
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
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(signature)

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THE HAGUE, 20/10/99
LA HAYE, LE

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Blatt 2 d r Bescheinigung
Sheet 2 of the certificate
Page 2 de l'attestation

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PACKAGING FOR WRAPPING

The present invention relates to packaging for wrapping, appropriate for use with an article to be wrapped and consisting of a film that can be cut into separate sheets intended to be closed by folding around the article that is to be wrapped.

Without being restricted thereto, the invention relates more specifically to the field of the wrapping of confectionery and chocolate products, or other consumables such as stock cubes, for example.

In general, the articles are wrapped individually in a rectangular sheet of preprinted film of an appropriate size and shape, which individually-wrapped articles can in turn be packed in bulk in a wrapping bag of an appropriate size. The article to be wrapped, which for example is of parallelepipedal shape, is, according to a common method of wrapping, placed in the centre of the reverse side, that is to say the unprinted side of a rectangular sheet. The two longitudinal sides are then turned up (or down, depending on the orientation of the article and the type of wrapping machine) vertically against the longitudinal faces of the article. The lateral sides are then turned up vertically against the two transverse faces of the article and their upper edges are folded flat over the top face of the article, these last two operations necessarily taking place via successive and oblique folding operations with the longitudinal sides already turned up. Wrapping is completed by folding the top edges (which in the mean-time have become trapezium-shaped tabs) of the longitudinal sides, one over the other, over the top face of the article.

It should, however, be noted, that depending on the shape of the product that is to be wrapped and on the nature of the wrapping machine, other sequences for the folding of the wrapping sheet are possible, these folding sequences being performed in a well-determined

configuration of fold lines. This configuration of fold lines of the wrapping sheet always remains the same for the same article to be wrapped using the same wrapping method.

A significant problem which arises here is that of holding the folds at the end of the wrapping operation so that the wrapping remains closed. This securing can only be provided at the expense of a special choice of film used as substrate, which has to have appropriate mechanical properties such as pliability and, in particular, a pronounced tendency not to return to its initial position after the sheet has been folded during wrapping.

This problem presents itself, in particular, when wrapping articles of small size such as confectionery products like sweets, pralines, lollies, barley sugar, chocolate-covered bars, etc., or stock cubes.

One known solution is to select special substrates known for their high pliability, such as waxed paper, cellophane, aluminium laminates or alternatively synthetic films containing an appropriate amount of an additive that increases the pliability of this substrate.

This solution does, however, considerably restrict the possible choice of films used as substrates for wrapping or considerably increases its cost.

Sheets for wrapping certain articles, such as stock cubes, are also known, in which films the wrapper is closed by bonding. For this purpose, the sheets comprise, on their right side, that is to say the side on the outside of the article that is to be wrapped, a hot-sealing coating structure, the configuration of which is adapted to suit the configuration of the folds made during wrapping.

This wrapping process has the disadvantage that the wrapping machine has to be specially adapted to this process in so far that a source of heat is

required. Furthermore, if this source of heat consists of heating plates, bonding can be achieved only on perfectly plane surfaces of the article that is to be wrapped and, in addition to the time needed to make the weld, requires relatively high pressure which a certain number of products are unable to withstand.

Another drawback is that this wrapping process is completely unsuitable for wrapping heat-sensitive articles, particularly chocolate products, and does not allow the selection of a wrapping substrate which has low temperature resistance.

The market is therefore looking for a multi-function solution which would enable a considerable broadening in the choice of film used as a substrate and which could be used at relatively high rates in such a way that the selection of the film used as a substrate could now be based merely on economic or aesthetic criteria.

The object of the present invention is therefore to propose a new packaging which offers this solution.

To this end, the invention proposes a packaging for wrapping of the kind described in the preamble, which is characterized in that at least one right side of each sheet of the said film comprises regions of cold-sealing coating arranged at least partially at the periphery of the sheets in a configuration such that most of these sealant-coated regions are superposed once a sheet has been folded around the article, sticking together and holding the folds in place around the said article.

The applicant company has surprisingly discovered that the at least partial prior coating of the film used as packaging for wrapping with a cold-sealing coating makes it possible, once the wrapping sheet has been closed by folding, to obtain folds which can be very well secured.

The fact is that the substance used as a sealing coating has little or no adhesion to a smooth

surface or to a surface treated for this purpose but, by contrast, exhibits good adhesion when applied to itself, which is what occurs during folding. The folds are therefore secured simply by applying light pressure and by the mutual superposition of certain sealant-coated regions, and this can be achieved without accessories other than those needed for folding the wrapper.

According to the present invention, the term cold sealing is to be understood as meaning sealing which takes place instantly by simple contact at a temperature of between about 0 and 50°C. In point of fact, the temperature is not a critical parameter for obtaining sealing by means of a cold-sealing coating and has practically no influence on the quality of the sealing obtained. Sealing can therefore be achieved without it being necessary to apply additional heat, at the ambient temperature of the place in which the wrapping unit is located.

In fact, cold-sealing coatings have hitherto been used above all in layers on a substrate which experiences little or no deformation. This means that significant problems of blockage due to the self-adhesive properties of the cold-sealing coating throughout the use of this cold-sealing coating on a non-planar substrate could be expected.

Astutely, the present invention puts this characteristic to good use in order to ensure that the folds are held.

The present invention therefore allows the use of films which are less expensive and exhibit better properties (rigidity, printability, aesthetic appearance) for wrapping articles, with no restriction regarding the shape of the said articles.

As to the use of rigid films, it will be noted that hitherto the use of rigid films for packages that have to be sealed by folding has been avoided. This is because these rigid films have a very low ability to hold the fold.

When a roll of film, one of the faces of which is coated with a sealing coating, is being prepared for wrapping, a non-stick coating is preferably applied to the other face so as to prevent contact adhesion between the face that is coated with the sealing coating and the other face upon rolling. It should, however, be noted that there do exist so-called "dry" cold-sealing coatings which, when used in conjunction with certain substrates such as polypropylene films, do not require such a non-stick coating. These two methods can also be used in the context of the present invention.

According to an advantageous embodiment, the structure of the sealant-coated regions comprises two structures of strips arranged in the shape of a W along the two opposite sides of the sheet, one strip along a third side of the sheet and between the two W-shaped structures and two regions in the two corners of the fourth side of the sheet.

The sealing coating strips arranged in the fold configuration may have a width of the order of 4 mm.

The configuration of the structure of the sealing coating strip may have varying forms depending on the article to be wrapped and depending on the folding sequences.

Aside from the strip structure along the folds to be made, each film has a strip of sealing coating along one edge of a third side. This strip will be on the tab which, at the end of the wrapping process, will be the first to be folded down onto the base of the article that is to be wrapped and will adhere to the tab which will be folded down last. Each sheet of wrapping film may also comprise additional regions of sealing coating allowing the tab which is folded down last to adhere to the base of the wrapped article and thus play a part in keeping the wrapper closed.

According to another embodiment, it is possible to provide, along the edge of one of the tabs which are folded down last at the end of the wrapping operation,

a strip of cold-sealing coating of the so-called "soft" type. This type of coating, unlike the dry coating discussed earlier, will adhere to the smooth face of the reverse side of the wrapping sheet. This strip of soft sealing coating provides good adhesion between the two longitudinal tabs folded down at the end of the wrapping operation and thus allows the production of a package which is hermetically sealed and improves the shelf life of the wrapped article by reducing the influence of factors such as moisture, odour, dust or the like on the article.

This adhesion between the coating of the soft type and the smooth surface of the reverse side of the film must not, however, be irreversible, because it must allow the film to be paid out when this film is packaged and stored on a roll, without the risk of the film tearing. Put another way, it is necessary to choose the sealing coating of the soft type to suit the nature of the substrate to which it is applied so that, on the one hand, it will adhere to the reverse side of the substrate weakly enough to allow the wrapping film to be paid out from a roll and, on the other hand, strongly enough to allow the package to be sealed almost hermetically. One could here speak of controlled adhesion. This controlled adhesion also has the advantage that the package can be opened and re-closed several times without an appreciable reduction in the quality of adhesion.

As mentioned earlier, one of the benefits of the present invention is that it affords the use of a broad range of possibilities regarding the nature of the substrate used. Examples of appropriate substrates are plastic films about 10 to 100 microns thick made of extruded and oriented polypropylene, of polypropylene in the form of a cast film, of polyester, of polyethylene, of extruded and oriented polyamide or of polyamide in the form of a cast film.

In accordance with the present invention, it is also possible to use a paper substrate (glazed or

coated). In general, any backing material or flexible wrapping material may be suitable as a substrate according to the present invention. These various substrates may consist of a single layer, a metallized single layer or several laminated and/or co-extruded layers.

The choice of cold-sealing coating is not critical. As cold-sealing coating of the soft type, it is possible to envisage pressure-sensitive adhesives which are substances which are permanently sticky and adhere spontaneously to the surface of most materials simply under the effect of a moderate amount of pressure.

As a general rule, pressure-sensitive adhesives are compositions based on natural and/or synthetic rubber associated with modified cellophanes, phenol-formaldehyde resins or hydrocarbon resins (waxes). In addition to rubbers, it is possible to make widespread use of polymers based on styrene, (meth)acrylic acid or vinyl ether, alone or in combination, and also in combination with resins. Finally, it is also possible to make use of silicone resins. Use will preferably be made of compositions containing mixtures of natural and synthetic rubbers and copolymers of (meth)acrylic acid and styrene.

In accordance with the present invention, the cold-sealing coatings are deposited on the substrates in quantities of 1 to 5 g/m^2 approximately.

The cold-sealing coatings may be applied in the form of a solution, a dispersion or even in the molten state.

Other particular features and properties of the invention will emerge from the detailed description of a number of embodiments given hereinbelow, by way of illustration, with reference to the appended drawings, in which:

- Figure 1 shows the right side of a first embodiment of a wrapping sheet according to the present invention;

- Figures 2 to 8 illustrate the successive sequences of one example of the wrapping of a sweet using the sheet of Figure 1;

- Figure 9 shows the right side of a second embodiment of a wrapping sheet according to the present invention;

and Figure 10 shows the right side of a third embodiment of a wrapping sheet according to the present invention.

Figure 1 depicts the right side, or printed side, of a wrapping sheet 20 after the sheet has been cut from a film paid out from a storage roll (not depicted).

The cold-sealing coating is deposited in a structure 22 which is adapted to suit the configuration of the fold lines made during wrapping, and an example of which will be described later on; in the case of Figure 1, there are two structures of strips 24, 26, with a width of the order of ± 4 mm, approximately in the shape of a W, along two opposite sides of the sheet 20, and a strip 28 along a third side of the sheet between the two lateral W-shaped structures. On the opposite side to the side of the strip 28, there are also, in the corner regions, two cold-sealing coated regions 30 and 32.

The sheet 20 of Figure 1 may be prepared by depositing, on the right side of an oriented polypropylene film 25 microns thick, which may or may not be metallized, a thin printed layer or primer (for example product 10-612205-4 MX41 by the company SIEGWERCK) intended to improve the adhesion of the printing ink. The film is then printed by techniques known per se such as, for example, heliographic or flexographic printing, or alternatively offset printing. A protective lacquer known per se is deposited over the printing. The structures 22 of cold-sealing coating are then deposited on this lacquer, in the pattern depicted in Figure 1. This

deposit may also be performed using printing techniques known per se.

As cold-sealing coating, use may be made of the product IP7905 or IP7936 by the company SWALE which will be deposited, for example, in quantities of 3 g/m^2. This is an adhesive coating of the dry type, which adheres only to itself. In other words, this coating does not adhere to the untreated smooth side of the reverse side of the film, which allows the film to be stored and packaged easily in the form of a roll without there being any problems of unrolling. This sealing coating also has the quality of having a low coefficient of friction (COF) on metal, which is of the order of 0.2 to 0.6, whereas the COF on metal is usually of the order of 1-1.5. This low coefficient of friction reduces the risks of jamming and of adhesion to the folding box.

An operation of wrapping a sweet of roughly parallepipedal shape with the sheet 20 of Figure 1 will now be described with reference to Figures 2 to 8. The sheet is placed over the sweet with the reverse or untreated side facing towards the sweet so that the strip 28 and the opposite side with adhesive regions 30 and 32 are in the longitudinal direction of the sweet and the W-shaped structures are in the transverse direction. The longitudinal sides of the sheet 20 are then folded down over the longitudinal faces of the sweet, as depicted in Figure 2.

The next operation consists in folding the central region of each side of the sheet with the structures 24 and 26 down over the lateral faces of the sweet 34, as depicted in Figure 3. This operation is performed by folding the longitudinal sides of the sheet 20 along oblique fold lines 36 and 38. As may be seen in Figure 3, the two W-shaped structures 24 and 26 (26 is not visible in Figure 3) of the sealing coating are arranged in such a way that the two outer limbs of the W-shaped structures run along the fold lines 36, 38

and that the V-shaped inside part is applied against the transverse side of the sweet 34.

The next operation consists in folding down, on each side of the sweet 34, the two flaps delimited by the fold lines 36 and 38 towards the inside in the direction of arrows 1 and 2 in Figure 3. This operation places the outer strips of the W-shaped sealing-coating structure, that is to say the strips which run along the fold lines 36 and 38, over the inside V-shaped strips and results in the configuration according to Figure 4. These folding sequences are obviously the same on both lateral sides of the sweet. Given that all of the strips of the two W-shaped structures 24 and 26 are fully superposed and that the cold-sealing coating used adheres perfectly to itself, the configuration of Figure 4 is a stable configuration and perfectly secures the folds made hitherto.

The next folding sequence is depicted in Figure 5 and consists in folding the lower parts of the previously folded and folded down lateral flaps onto the underside of the sweet 34. This operation is performed by folding the longitudinal sides along oblique fold lines 40, 42, 44, 46 which transform the longitudinal sides into trapezium-shaped tabs 48, 50. The result of this folding sequence is clearly visible in Figure 6 which depicts a view from underneath and of the face that was hidden in the previous figures.

Here too, it should be noted that the two cold-sealing coated regions 30 and 32 are arranged in such a way that their inside oblique edges (see also Figure 1) run along the fold lines 40 and 42 of the tab 48, as can be seen in Figure 6.

Figures 7 and 8 illustrate the last phases of wrapping. First of all, tab 50, which has the sealing coating strip 28, is folded down onto the inside face as depicted in Figure 7. The second tab 48 is then folded down onto the tab 50 to form the configuration of Figure 8.

When the tab 48 is folded down, the two sealant-coated regions 30 and 32 are partially superposed on each other and partially applied to the adhesive strip 28 of the tab 50. As a result, given that the tab 48 adheres to itself and to the tab 50, the configuration of Figure 8 is a stable configuration with all the folds held in place securely.

It should, however, be noted that when the tab 48 is folded down onto the tab 50, the adhesive strip 28 adheres to the adhesive regions 30 and 32 only by its ends. They contrast, its central part will come into contact with the reverse side of the tab 48, to which it will not adhere. In other words, while the sheet of Figure 1 produces a wrapping which closes stably and permanently, it does not provide a hermetic seal.

All the wrapping sequences described below are performed automatically in a wrapping machine. In this context, it is important to note that the wrapping sheets proposed are suitable for existing wrapping machines without any need for modification or adaptation. It should, however, be noted that the wrapper described below is merely one example of a folding configuration of a given machine. Other machines may perform folding operations along different fold line configurations. This being the case, the pattern of adhesive structures shown in Figure 1 would need to be adapted to suit the configuration of the fold lines produced by the folding machine, the reverse being more difficult.

A second embodiment of a wrapping sheet according to the present invention and depicted overall with the reference 52 will now be described with reference to Figure 9.

A sheet, for example made of oriented polypropylene on which a structure 22 of cold-sealing coating is deposited as in the case of Figure 1 is prepared and printed. A strip 54 of cold-sealing coating of the soft type is then deposited only along

the adhesive strip 28. The product 22-392 or the product 22-263 by the company CRODA and deposited in quantities of 3 g/m^2 may be used for this. The dry-type adhesive of the strip 28 acts as a primer for the soft adhesive of the strip 54.

The soft-type adhesive of the strip 54 has the property of adhering not only to itself but also to the smooth untreated surface of the reverse side of the sheet 52. The result is that when the sheet 52 is used for a wrapping operation according to Figures 2 to 8, at the end of wrapping, when the tab 48 is folded down onto the tab 50 (see Figures 7 and 8) and onto its adhesive strip 54, the reverse side of the tab will adhere to the adhesive strip 54 of the tab 50. This thus produces a wrapper which not only has a good ability to hold the folds in place but which in addition is sealed and hermetic.

According to another aspect of the invention, the type of soft sealing coating is chosen so as to have controlled adhesion, or more specifically, so that this adhesion is strong enough to seal the wrapper closed but not so strong that adhesion is irreversible. In other words, the adhesive strip 54 has to be able to be unstuck without difficulty from the smooth surface of the sheet 52. This also allows the film to be stored on a roll without the risk of tearing during unrolling.

Figure 10 depicts a third embodiment of a wrapping sheet according to the present invention and denoted overall by the reference 56.

Once again, use may be made of an oriented polypropylene film which is printed appropriately, possibly after having deposited a primer. A non-stick coating 60 is then deposited over the entire right side. Suitable non-stick products consist of mixtures of polyamide resin and of polyethylene wax (for example the products 10-609345-3P by the company SIEGWERCK and 994404-X by the company SICPA) deposited in quantities of 1.5 g/m^2. Patterns 22 of dry-type cold-sealing coating identical to those of Figure 1 are then applied

to this coating. A strip of cold-sealing coating of the dry type is then applied to the reverse side, more or less between the regions 30 and 32 of the right side, as depicted in broken lines at 58. When the sheet 56 is used for the wrapping as described with reference to Figures 2 to 8, the adhesive strip 58, will at the end of the wrapping operation (see Figure 7) be on the inside of the tab 48 and, when this tab is folded over, it will adhere to the adhesive strip 28 of the tab 50 to form an hermetic package.

When the film according to Figure 10 is stored in the form of a roll, the adhesive strips 58 on the reverse side are generally in contact with the non-stick coating 60 on the right side, to which they do not adhere. The strips 58 will also nonetheless come into contact with the adhesive strips 28. This time, by choosing the nature of the adhesive of the strip 58 and its controlled adhesion, it will also be possible to unstick and unroll film from a roll.

It will also be noted that, given that the adhesive strip 58 is applied to the strip 28 as the wrapping is closed, the sealing coating of the strip 58 could be of the dry type, which would reduce the risk of adhesion to the right side when the film is stored in the form of a roll.

It should be noted that it is also possible to equip the right side of the sheet 52 of Figure 9 with a non-stick coating similar to the one of Figure 10 in order to make it easier to unroll a film which is stored in the form of a roll.

Instead of providing strips of sealing coating of a generally rectangular shape, as shown in the figures, it is possible to provide egg-shaped bands. This allows progressive detachment, with lower risk of tearing when the wrapper is opened or when the film is paid out from the roll.

CLAIMS

1. Packaging for wrapping, designed for packaging an article (34), particularly a food product, this packaging consisting of a film which can be cut into separate sheets (20, 52, 56) intended to be closed by folding around the article (34), the said film mainly comprising a material which has the particular feature of not holding folds, characterized in that at least one right side of each sheet of the said film comprises regions of cold-sealing coating (22) arranged at least partially at the periphery of the sheets (20, 52, 56) in a configuration such that most of these sealant-coated regions are superposed once a sheet has been folded around the article, sticking together and holding the folds in place around the said article.

2. Packaging according to Claim 1, characterized in that the reverse side of each sheet (56) of the said film has at least one region of cold-sealing coating (58), designed to be at least partially superposed, once the sheet has been folded, with a region of cold-sealing coating present on the right side.

3. Packaging according to either one of Claims 1 and 2, characterized in that the said cold-sealant-coated regions on the right side of each sheet (20) of the said film extend at least along three sides of this sheet, at least a central region of the fourth side being free of sealing coating.

4. Packaging according to Claim 3, characterized in that a region of cold-sealing coating (54) deposited on the right side of each sheet (52) is deposited to at least partially correspond with one of the three sides of this sheet, the said side being the side opposite the said fourth side which has the central region free of sealing coating.

5. Packaging according to Claim 3, characterized in that the said cold-sealant-coated region (58) deposited on the reverse side of each sheet (56) is

deposited to at least partially correspond with the central region of the fourth side which is free of sealing coating.

6. Packaging according to either one of Claims 4 and 5, characterized in that the said cold-sealing coating of the sealant-coated regions (54, 58) deposited on the right and reverse sides respectively of each sheet is of the soft type.

7. Packaging according to either one of Claims 4 and 5, characterized in that the said cold-sealing coating of the sealant-coated regions (54, 58) deposited on the right and reverse sides respectively of each sheet is spread out in the form of an egg-shaped strip.

8. Packaging according to any one of the preceding claims, characterized in that the cold-sealing coating (22) on the right side is a coating of the dry type which sticks only to itself or to a coating of the same type.

9. Packaging according to any one of Claims 1 to 5, characterized in that the cold-sealing coating deposited on the regions arranged on the right side of each sheet is identical to the one deposited on the regions arranged on the reverse side of each sheet.

10. Packaging according to any one of Claims 1 to 5, characterized in that the cold-sealing coating deposited on the regions arranged on the right side of each sheet is different from the one deposited on the regions arranged on the reverse side of each sheet.

11. Packaging according to any one of the preceding claims, characterized in that each sheet (52, 56) comprises, over its entire right side, a non-stick coating (60) which is applied before the sealing coating of the regions of cold-sealing coating (22).

ABSTRACT

The packaging consists of a film which can be cut into separate sheets (20, 52, 56) intended for wrapping an article (34), particularly a food product, by folding the sheet around this article (34). To make it easier to choose the material of the film without having to take account of its ability to hold folds, at least a right side of each sheet of the film has regions of cold-sealing coating (22) arranged in a configuration such that most of these regions of sealing coating are juxtaposed when a sheet is folded.

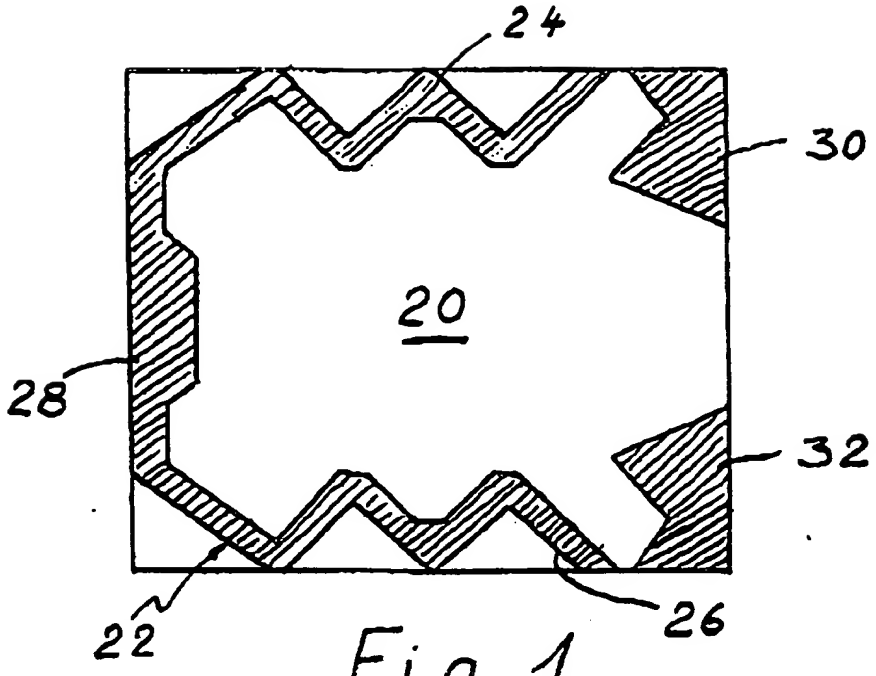

Fig. 1

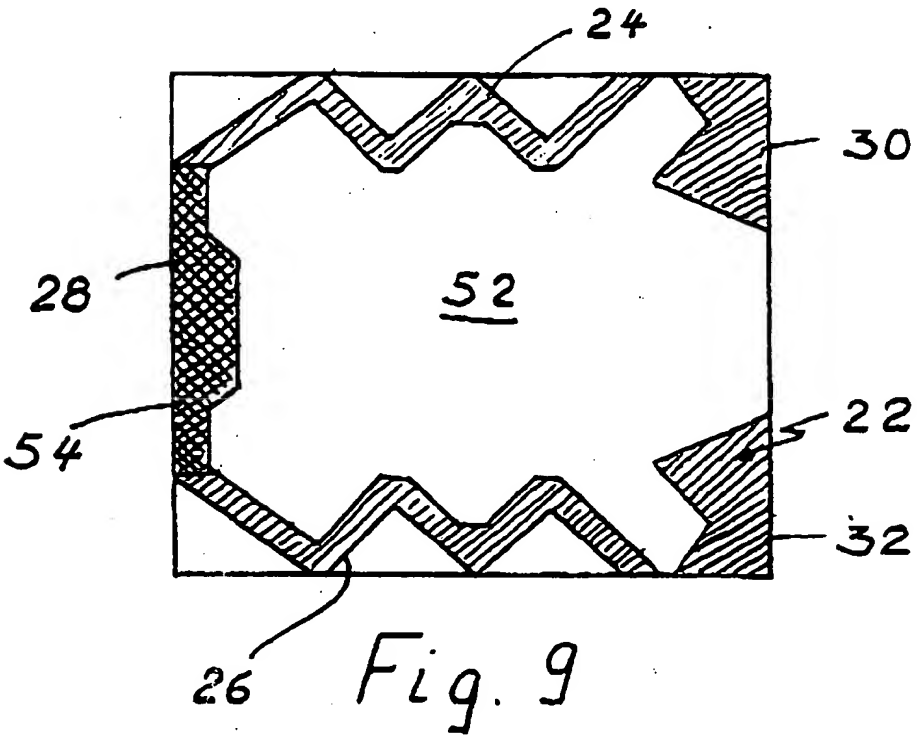

Fig. 9

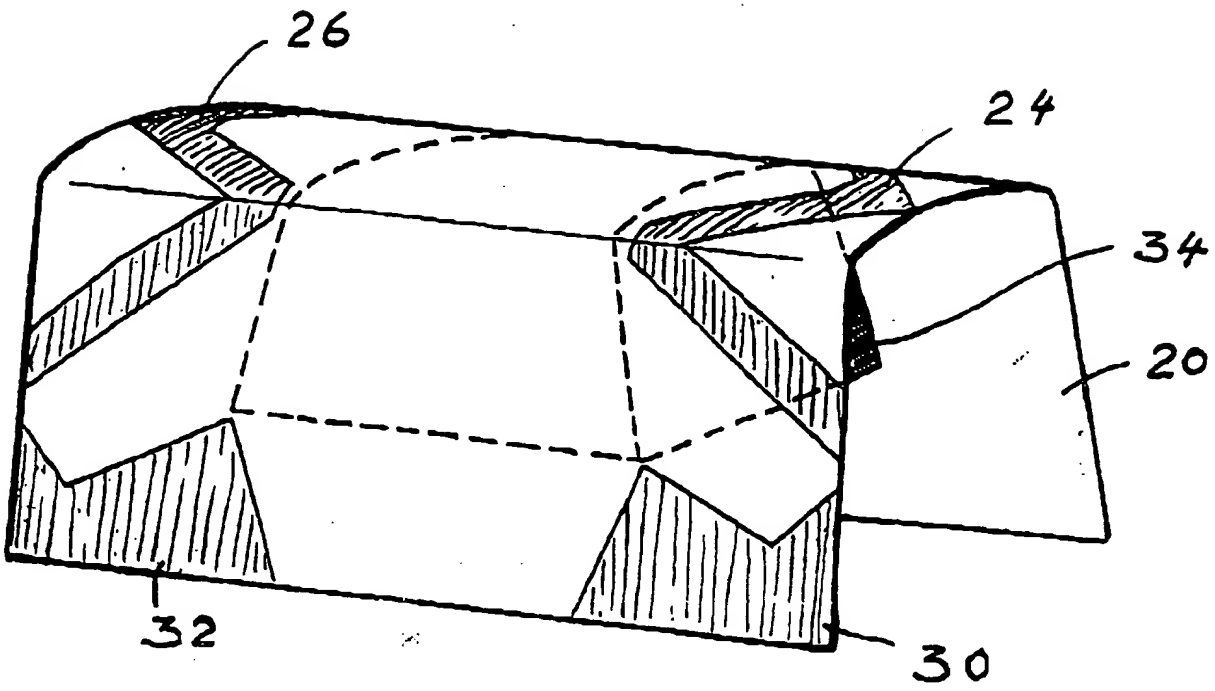

Fig. 2

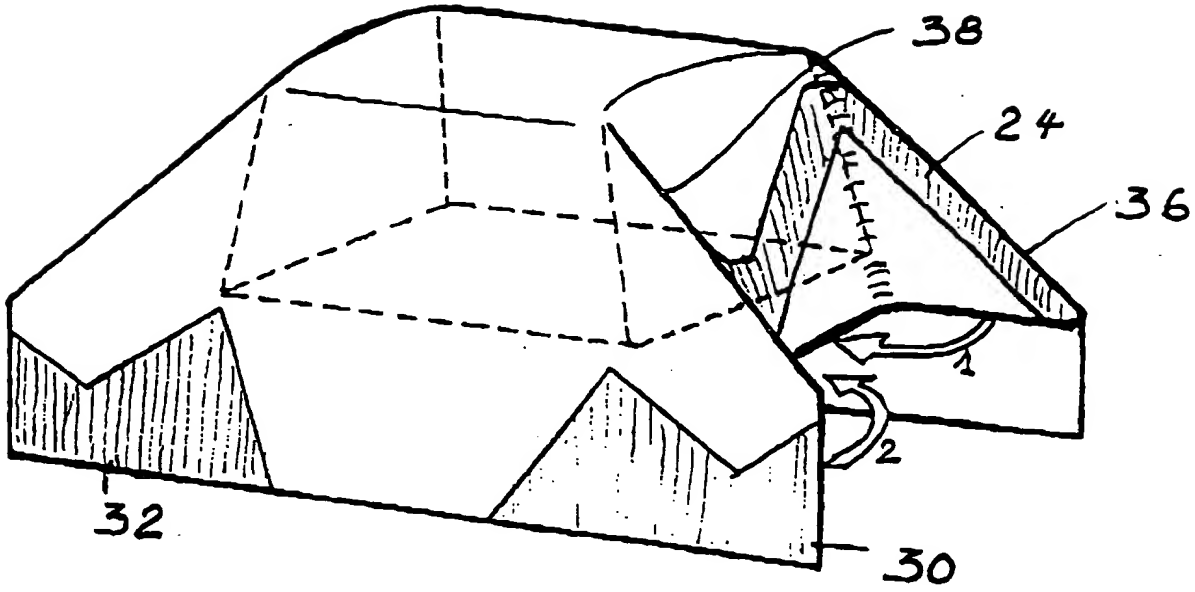

Fig. 3

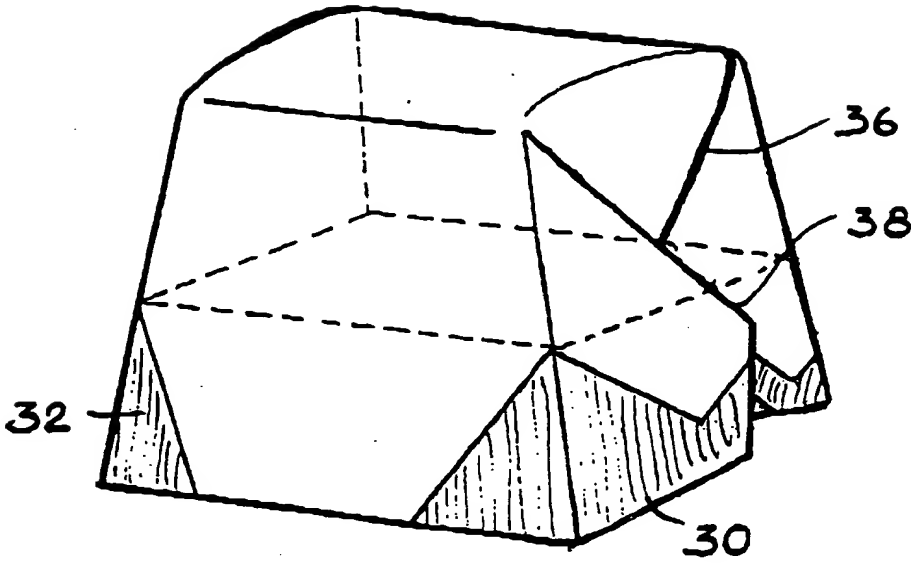

Fig. 4

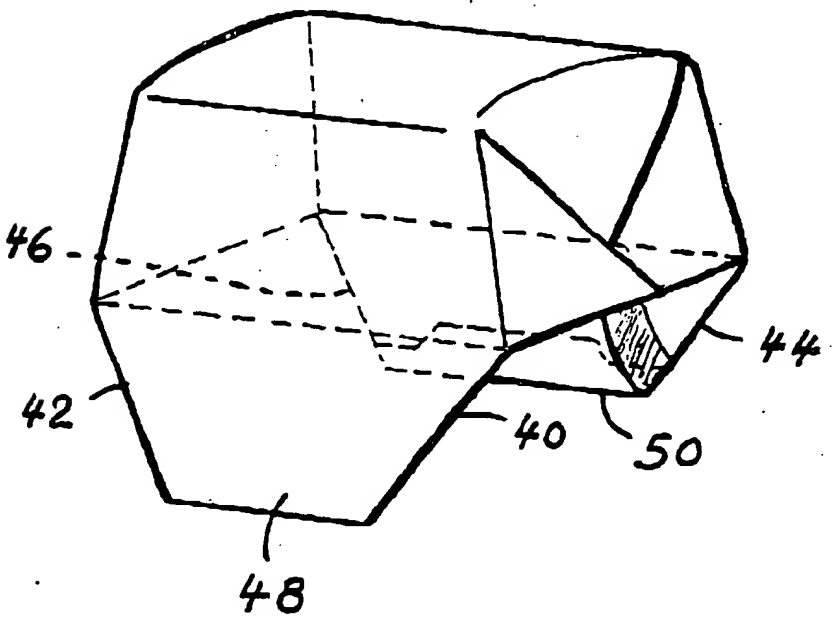

Fig. 5

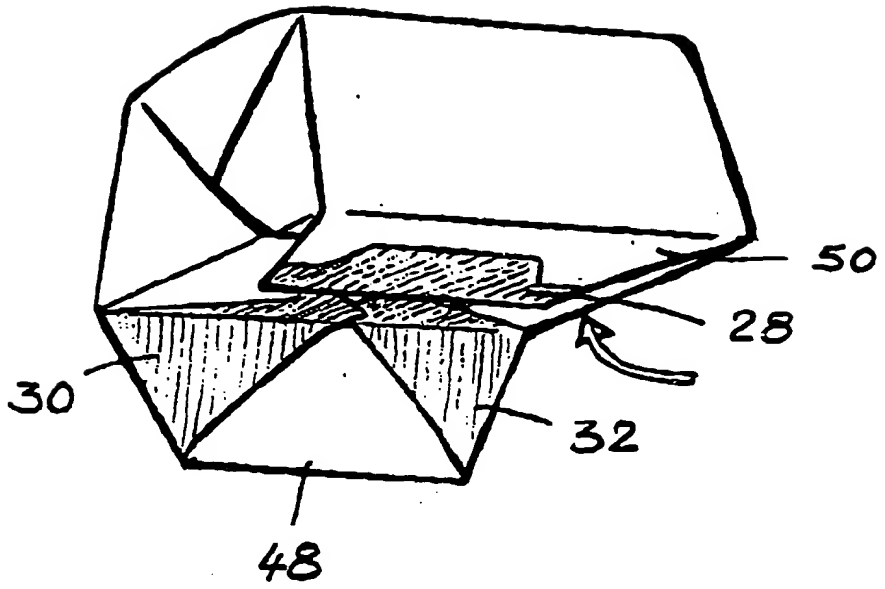

Fig. 7

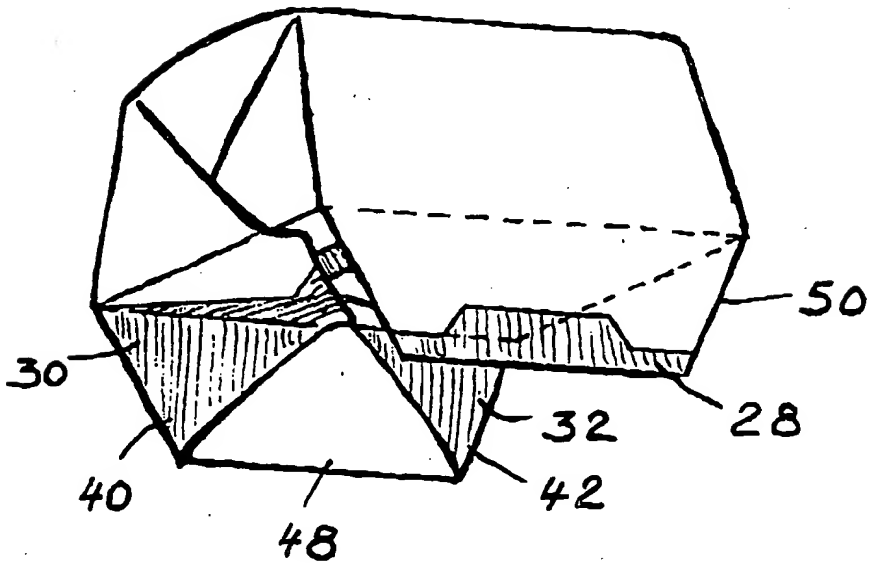

Fig. 6

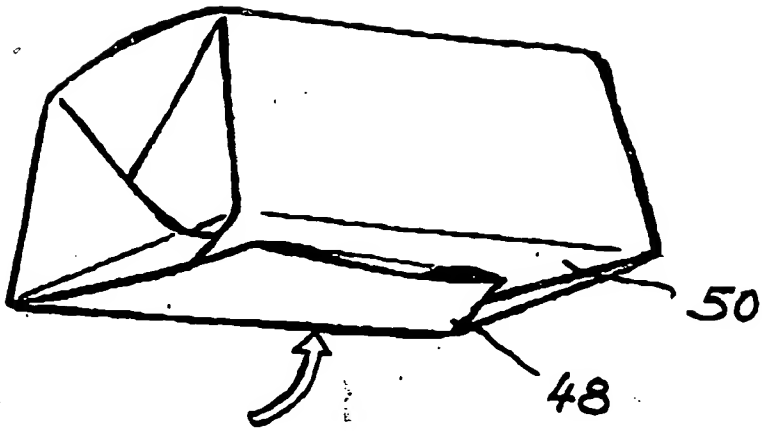

Fig. 8

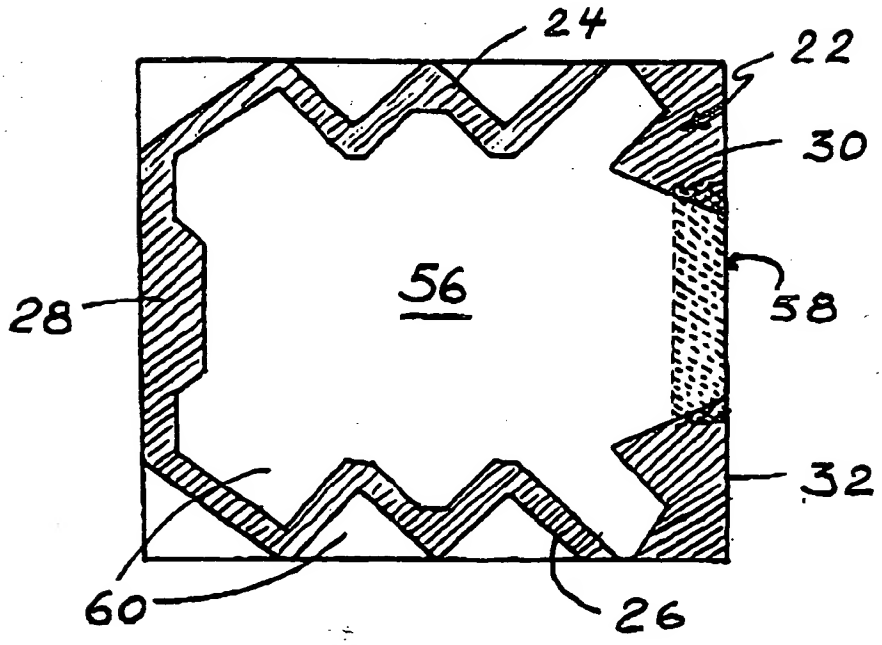

Fig. 10